Claims

1. An opening device moulding apparatus for injection moulding plastics material opening devices at holes in a packaging material sheet, comprising:

at least one first mould tool arrangeable in a closed position so as to be in contact with a first side of the sheet positioned at said opening device moulding station and arrangeable in an open position so as to be positioned distally from the first side of the sheet positioned at said opening device moulding station;

at least one second mould tool arrangeable in a closed position so as to be in contact with a second side of the sheet positioned at said opening device moulding station and arrangeable in an open position so as to be positioned distally from the second side of the sheet positioned at said opening device moulding station;

wherein in the closed positions of said first and second mould tools a mould cavity is formed between said first and second mould tools for at least partially accommodating a hole edge in the sheet positioned at said opening device moulding station; and

an injection passage for injecting heated thermoplastics material into said mould cavity, wherein said injection passage extends in at least one of said first and second mould tools such that the thermoplastics material is injected directly into the mould cavity at an injection point of the mould cavity which is located distally from said hole edge accommodated in said mould cavity.

2. The apparatus of claim 1 wherein said mould cavity has a base portion for accommodating said hole edge in the closed positions of said first and second mould tools and for forming a base of a moulded opening device, and a lid portion for forming a lid of the moulded opening device.

3. The apparatus of claim 1 wherein said injection point of the mould cavity is arranged at said lid portion in a substantially central position with respect to said base portion.

4. The apparatus of claim 3 wherein said injection channel extends substantially perpendicularly to the extension of said lid portion of said mould cavity.

5. The apparatus of claim 1 further comprising a drive mechanism for selectively moving said first mould tool and said second mould tool between said open and closed positions, at least one of said first and second mould tools comprising a pair of half mould tools, wherein said drive mechanism comprises:

a supporting structure for supporting said half mould tools such that in the open position said half mould tools are mutually spaced from each other in an extension plane extending substantially parallel to the plane of extension of the sheet and such that in the closed position said half mould tools are mutually arranged in contact with each other and with said second sheet side; and

a driver for moving said half mould tools simultaneously from the open position to the closed position and vice versa such that the direction of movement of each of said half mould tools between said open and closed positions comprises a directional component extending parallel to said extension plane and a directional component extending perpendicularly to said extension plane.

6. The apparatus of claim 5 wherein said drive mechanism is configured such that the direction of movement of each of said half mould tools between said open and closed positions tangentially follows a circular path.

7. The apparatus of claim 5 wherein in said closed position said sheet extends in a plane which is distally spaced from the plane of extension of said sheet in said open position.

8. The apparatus of claim 5 further comprising an adjustable biasing device for adjustably setting a contact force between said half mould tools in said closed position.

9. A method for direct injection moulding of a plastics material opening device to a hole which is disposed in a sheet of packaging material and which has a hole edge, comprising the steps of:

arranging at least one first mould tool in contact with a first side of the packaging sheet material and arranging at least one second mould tool in contact with a second side of the packaging sheet material and thereby forming a mould cavity defined between said first and second mould tools in a manner such that at least a portion of said hole edge is arranged inside said

mould cavity; and

injecting plastics material into said mould cavity so as to form the plastics material opening device wherein the plastics material is injected directly into the mould cavity at an injection point of the mould cavity which is located distally from said portion of the hole edge.

10. The method of claim 9 including arranging the first and second mould tools so as to form a mould cavity having a base portion for forming a base of the opening device and a lid portion for forming a lid of the opening device in a manner such that all of said hole edge is arranged inside said base portion of said mould cavity.

11. The method of claim 10 including injecting plastics material at an injection point arranged at the lid portion of the mould cavity in a substantially central position with respect to said hole edge.

12. The method of claim 11 including injecting plastics material through a injection channel which is disposed in one of said first and second mould tools and which extends substantially perpendicularly to the extension of said lid portion of said mould cavity.

13. A plastics material opening device obtained by a method for direct injection moulding of a plastics material opening device as defined in one or more of claims 9-12.

14. A package for pourable food products, comprising a plastics material opening device obtained by the method as defined in one or more of claims 9-12.